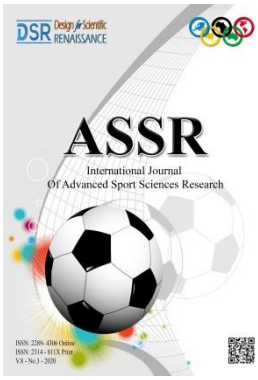
**Article Info.**
Received: Jul. 31, 2020
Accepted: Aug. 10, 2020
Published online: Sep. 1, 2020




# "The effect of special endurance Exercises on developing some biochemical variables among young boxing players under 18 years of age"

**Lect. Aqeel Abdul-Jabbar Abdul Rasoul**

**University of Babylon - College of physical Education and Sports Sciences**

**Abstract**

The research problem centered on the fact that most coaches use exercises to overcome fatigue without knowing their physiological and chemical effects, and through the researcher follow up, being one of the specialists in this game, he noticed differences in the boxer's muscle fatigue during competition and after interviewing most trainers, it became clear that there are no special tests for biochemical variables that happens to an athlete during a competition or exercise. Therefore, the researcher prepared special endurance exercises to develop some biochemical variables for young boxers under the age of 18 years. The research aims to identify the effect of special endurance training on developing some biochemical variables among young boxers under the age of 18 years. The research community was identified with the 13 young boxing players belonging to the Hilla Sports Club for the 2019 season, where the researcher used the comprehensive inventory method by selecting the research sample. The sample was divided into two groups (experimental - control) and each group had (5) players, and (3) players were selected for the pilot study. Through the researcher's review of many scientific sources and references in the field of physiology of sports training - boxing, the following variables were identified, which are: The hormone beta - endorphin, the percentage of lactic acid concentration in the blood, the enzyme lactate dehydrogenate (LDH). The researcher concluded that the special endurance exercises worked to improve the hormone endorphins, lactic acid, the enzyme lactic dehydrogenate in the research sample and the exercises prepared by the researcher reduced fatigue during competition.

**Keywords**: special endurance, biochemical variables, boxing.

## 1- Introduction:

The great achievements that were made in the various events did not come by accident, but through proper scientific planning and the recruitment of specialists in the field of sports for all sciences to serve the achievement in events and sports. The physiology of training is one of the specialties that have provided great services through the development of functional devices and the maintenance of athletes 'health and safety from diseases. Boxing is one of these areas that have developed greatly as a result of these efforts, and specialists have made strenuous efforts over many years in order to raise the level of the game by following all modern scientific methods . Therefore, the process of preparing a player and qualifying him physically, professionally, skillfully and psychologically are important matters that positively affect the player. However, this event involves practicing scientifically unexamined methods, as boxing athletes are constantly looking for means that raise their level of performance to the extent that exceeds their individual abilities in order to achieve sporting achievements and reach advanced positions. So ,in this study the researcher tries through scientific research to identify the negative and positive effects of exercises for special endurance in some biochemical variables, so the researcher prepared special endurance exercises in developing some biochemical variables among young boxers under the age of 18 years.

The research problem centered on the fact that most coaches use exercises to overcome fatigue without knowing their physiological and chemical effects, and through the researcher follow up , being one of the specialists in this game, he noticed differences in the muscle fatigue of the boxer during the competition and after interviewing most trainers it became clear that there are no special tests for biochemical variables that happens to an athlete during a competition or exercise. Therefore, the researcher prepared special endurance exercises to develop some biochemical variables among young boxers under the age of 18 years.

The research aims to identify The effect of special endurance exercises on developing some biochemical variables among young boxers under the age of 18 years.

Research hypotheses: There is a positive effect of special endurance exercises on developing some biochemical variables of young boxers under the age of 18 years

Research scopes:

- The human field: Young Hilla club boxers under the age of 18 for the 2019 training season.
- The temporal field: The research was conducted for the period from 1/5/2019 to 3/17/2019.
- Spatial Domain: Al Hilla Boxing Club Stadium.

## Research Methodology

The researcher used the experimental method with the experimental design of equal groups by pre and post measurement to suit the nature of the research

## Research community and sample

The research community was identified with the 13 youth boxing players belonging to the Hilla Sports Club for the 2019 season, where the researcher used the comprehensive inventory method by selecting the research sample. The sample was divided into two groups (experimental - control) and each group had (5) players, and (3) players were selected for the pilot study.

**Means, tools and devices used in the research**

- Test and measurement.
- Observation.
- questionnaire.
- (DELL) computer device Japanese-made.
- (SONY) camera.
- Cotton tape measure.
- Buerer medical scale (Chinese made - Lactate Pro2) Japanese made.
- Boxing gloves, 13 pairs..

**Field research procedures**

**Determination of biochemical variables**

Through the researcher's acquaintance with many scientific sources and references in the field of physiology of sports training - boxing, it has been concluded to identify the following variables:

1- The beta hormone - endorphins.
2- The percentage of lactic acid concentration in the blood.
3- Lactate dehydrogenate (LDH) enzyme.

**Biochemical parameters used in the research**

**First: Beta-endorphin hormone**

The concentration of the beta-endorphin hormone was measured using the cusabio diagnostic Chinese kit and this will be on the device (Elisa Reader) in order to give the desired results from it, noting that the normal ratio of the hormone is (4.7 to 6.9 pg / milliliter. The measurement was performed in two stages at rest and after a 3-minute trial run, and blood is drawn from the vein.

**Second: Measuring lactic acid in the blood**

The researcher used a hand-held lactic acid concentration meter (Lactate Pro2) The process of measuring the level of lactic acid in the blood was carried out in two stages, the first before the effort and the second after (5) minutes of rest after the effort, which is the best period for the drainage of lactic acid from the muscles into the blood.

The effort was a modified lactic endurance test and the test starts after the player completes the appropriate warm-up for a period of 5-10 minutes. The player ascends the tread mill, as he starts operating the device at the specified speed (14 km / h), noting that the device starts increasing the speed gradually up to the specified speed, and this gives the laboratory the opportunity to work on the device in a consistent and consistent manner, and after reaching the specified speed, the stopwatch starts by the timer and the player continues to work on the device for two minutes.

**Third: the enzyme lactate dehydrogenate LDH**

Blood samples were drawn from the players during the period of complete rest, i.e. before the effort, once, and at other times after the physical effort for (3) minutes, i.e. after the player had finished a competitive round on the boxing ring, a run for the beta endorphin hormone and after (300 m) for the LDH enzyme as he sits The contestant is on a seat adjacent to the test site and next to a flat table and the upper arm is tied with a rubber band in order to show the blood drawing area, and a 5cc

blood sample is drawn, after which the blood sample is discharged into a plastic tube slowly and on the inner wall of the tube to avoid the occurrence of hemolysis has been used. Tubes free of any anticoagulant. The serum was separated from the blood components through a centrifugation process (CENTER FUGE), where the test tubes containing the blood samples were placed in opposite pairs in a centrifuge, then the rotation process took place inside the device at a speed of (4000) revolutions / minute, where the serum was withdrawn after the separation process ends by pipette and placed in a dry numbered tube and kept for analysis.

**Pilot Study**

The researcher conducted the pilot study on (5/1/2019) with a working team assisting (3) players from the research community and outside the main research sample, and its purpose is: to identify the errors, obstacles, and negatives that may accompany the experiment, and to identify the validity of tools and devices to know the exercise intensity and time for the research sample, and to know the time for performing the test.

**pre-tests**

Pre-tests were conducted on individuals of the research sample on 01/10/2019 to determine the level of biochemical variables. Physiological tests and measurements were conducted at ten o'clock in the morning in the Boxing Castle inside the Hilla Sports Club, and blood was drawn under the supervision of a specialized medical staff.

**Equivalence of the research sample :**

To verify the equivalence of the two sample groups with respect to the physiological and skill variables under investigation, the results of parity were as in Table (1)

Table (1) Shows the equivalence of the research sample

| Researched variables | measuring unit | Experimental Group | | Control Group | | Mann and Tenny calculated value | Significance level | differences Significance |
|---|---|---|---|---|---|---|---|---|
| | | Mediator | Spring Deviation | Mediator | Spring Deviation | | | |
| Endorphin hormone | 1 mmol / mg | 24,2249 | 04,717 | 12,2122 | . 09,711 | 76,889 | 0,231 | Not significant |
| While at rest | 1 mmol / mg | 32,2810 | 58,99 | 33,2911 | 89,567 | 78,998 | 0,453 | Not significant |
| Endorphin hormone | 1 mmol / mg | 38,353 | 26,75 | 56,333 | 76,24 | 88,998 | 0,231 | Not significant |
| While at rest | 1 mmol / mg | 25,339 | 26,95 | 97,338 | 88,27 | 87,989 | 0,089 | Not significant |
| LDH at rest | Mmol / liter | 1,750 | 0,105 | 1,741 | 0,342 | 30,11 | 0,876 | Not significant |
| LDH after voltage | Mmol / liter | 79,11 | 1,25 | 11,54 | 1,98 | 33,87 | 0,062 | Not significant |

Sample size (10) and significance level (0.05)

Table (1) shows that the level of significance for all the investigated variables is greater (0.05), and this gives the absence of significant differences between the members of the two research groups, and this means an indicator of parity of the two research groups. It is a very necessary requirement in the experimental approach to have all the sample members on a single initiation line when starting the main experiment.

**Main Experience**

The training was in the special preparation stage. The researcher took into account the principle of diversity in the exercises used. The training period was at the rate of (3) training units per week on days (Saturday, Monday, Wednesday) and for a period of (8) weeks starting from 1/15/2019 to 15/15 3 / 2019.The training intensity ranged between 80% - 90% of the maximum ability of the player, as the maximum intensity of the exercises used in the exploratory experience was determined for each player, and these exercises were applied at the beginning of the main section of the training unit.

**Dimensional measurements and tests**

The researcher conducted the post-tests on the individuals of the research sample on 3/17/2019, and they were conducted under the same circumstances and conditions in which measurements and pre-tests were performed as much as possible.

**Statistical methods**

The statistical package (spss) was used to process the data obtained by the researcher from the pre and post tests and by the following statistical means: median, quartile deviation, simple correlation coefficient (Pearson). Mann-Whitney test; Wilcoxen test.

**Presenting, analyzing and discussing the results**

**Presentation and analysis of results**

**Presentation and analysis of the results of the pre and post tests of the experimental group.**

Through the data obtained from the (pre-post) test, and to prove the research hypothesis and achieve its objectives, and to identify the effect of dynamic lactic training, the researcher used the non-parameterized statistical method (Wilcoxen) as shown in Table (2)

Table (2) shows the mean value, the quartile deviations, the Lucoxin value, and the statistical significance of testing the investigated variables for the experimental group.

| variables | Measure unit | pre | | post | | Wilcoxen value | Significance level | Significance difference |
|---|---|---|---|---|---|---|---|---|
| | | mediator | Deviation | mediator | Deviation | | | |
| Endorphin hormone While at rest | 1mmol / mg | 24,2249 | 04,717 | 1,1009 | 95,487 | 2,657 | 0,000 | Significant |
| Endorphin hormone While at rest | 1mmol / mg | 32,2810 | 58,599 | 3,3331 | 26,527 | 1,987 | 0,000 | Significant |
| LDH while rest | 1mmol / mg | 38,353 | 75,26 | 0,398 | 08,64 | 1,876 | 0,001 | Significant |
| LDH after | 1mmol / | 25,339 | 95,26 | 0,369 | 26,61 | 3,982 | 0,002 | Significant |

| variables | Measure unit | pre | | post | | Wilcoxen value | Significance level | Significance difference |
|---|---|---|---|---|---|---|---|---|
| | | mediator | Deviation | mediator | Deviation | | | |
| effort | mg | | | | | | | |
| Lactic acid Before the effort | 1mmol /lit. | 1,750 | 0,105 | 1,383 | 0,117 | 1,09 | 0,004 | Significant |
| Lactic acid after the effort | mmol /lit. | 11,79 | 1,25 | 9,76 | 2,87 | 5,76 | 0,004 | Significant |

Sample size (10) and level of significance (0.05)

Table (2) shows that the level of significance between the results of the pre and post tests of the experimental group in the investigated variables is less than the level of significance (0.05), which means that the differences between the pre and post tests were statistically significant in these variables.

**Presenting and analyzing the results of the pre and post tests for the control group**

Table (3 )shows the mean value, the spring deviations, the Lucoxin value, and the statistical significance of testing the searched variables for the control group.

| variables | Measure unit | pre | | post | | Wilcoxen value | Significance level | Significance difference |
|---|---|---|---|---|---|---|---|---|
| | | mediator | Deviation | mediator | Deviation | | | |
| Endorphin hormone While at rest | 1mmol / mg | 1,2122 | 0,711 | 8,3111 | 7,543 | 2,76 | 0,000 | Significant |
| Endorphin hormone While at rest | 1mmol / mg | 3,2911 | 8,567 | 9,2988 | 6,571 | 3,87 | 0,000 | Significant |
| LDH while rest | 1mmol / mg | 56,333 | 24,76 | 7,344 | 65,90 | 3,99 | 0,000 | Significant |
| LDH after effort | 1mmol / mg | 97,338 | 88,27 | 8,376 | 88,67 | 2,76 | 0,000 | Significant |
| Lactic acid Before the effort | 1mmol /lit. | 1,741 | 0,342 | 1,689 | 0,24 | 1,982 | 0,000 | Significant |
| Lactic acid after the effort | mmol /lit. | 54,11 | 1,98 | 10,86 | 2,01 | 3,887 | 0,000 | Significant |

Sample size (10) and level of significance (0.05)

**4.1.3Presentation and analysis of the post-test results for the experimental and control groups**

Table (4) shows the meanings of the control experimental groups and the statistical significance of the post-tests of the researched variables.

| variables | Measure unit | pre | | post | | Wilcoxen value | Significance level | Significance difference |
|---|---|---|---|---|---|---|---|---|
| | | mediator | Deviation | mediator | Deviation | | | |
| Endorphin hormone While at rest | 1mmol / mg | 1,1009 | 95,487 | 8,3111 | 7,543 | 0 | 0,000 | Significant |
| Endorphin hormone While at rest | 1mmol / mg | 3,3331 | 26,527 | 9,2988 | 6,571 | 0 | 0,000 | Significant |
| LDH while rest | 1mmol / mg | 0,398 | 64,08 | 7,344 | 90,65 | 3,99 | 0,02 | Significant |
| LDH after effort | 1mmol / mg | 0,369 | 61,26 | 8,376 | 88,67 | 2,09 | 0,00 | Significant |
| Lactic acid Before the effort | 1mmol /lit. | 1,383 | 0,117 | 1,831 | 24,0 | 2,98 | 0,04 | Significant |
| Lactic acid after the effort | mmol /lit. | 9,76 | 2,87 | 86,11 | 2,01 | 0 | 0,02 | Significant |

Sample size (10) and level of significance (0.05)

Table (4) shows that the level of significance between the results of the post tests of the experimental and control groups in the studied variables is less than the level of significance (0.05), which means that the differences between the post tests of the experimental and control groups were statistically significant in these variables and in favor of the experimental group.

**Discussion of results**

Through the results that appeared in Table (2.3.4) regarding the research variables under study for the experimental and control groups, we see that there are significant differences between the pre and post tests of the experimental group after implementing the exercises prepared by the researcher . Table (4) shows that there are Significant differences between the post reports of the experimental and control groups and for the benefit of the experimental group. The researcher attributes the reason for this improvement to the nature of the exercises prepared by the researcher in the special endurance method, as the proposed training program included training methods for developing aerobic and non- anaerobic lactic abilities, which contained many methods, including (long-speed exercises - The rise of the stands - the use of different muscle contractions - the vertical - the lactate endurance - the production of lactate - the dynamism of lactate - the oxygen consumption - the interval of high and low-intensity quality - and continuous). It is appropriate for them, depending on the level of the players themselves, to ensure the progress of the level of the players. The

researcher took care of building in the program of the training principle of adaptation to the different training loads, up and down the intensity of the training. Bastwissi Ahmed (1997) and Issam Abdel Khaleq (1992) emphasizes training as an important basis for the development of the athlete's condition and the progress of the level so that it must be continuous throughout the training season, and that the program includes the appropriate training loads for each training phase so that it can be Stabilizing the adaptation process and diversifying the training program in terms of training methods as well, not just in methods, where two methods were used (interval in quality - repetitive - continuous intermittent), in order to develop the special physical abilities of boxers and this is consistent with what was mentioned by Ahmed Mahmoud Al-Khadim (1999) and Hussein Manati Saget (2017) that my interval method depends on the position of the body in training periods governed by the relationship with a certain severity and repetition at intervals of time interspersed with appropriate and convincing breaks, which gives training with the two methods a greater opportunity to develop speed and strength prolongation. The researcher also took into account the diversity of training load formations during the implementation of the proposed program training attempt to increase the intensity of the exercise in order for the muscles to produce more lactic acid with the players enduring muscular work in quality, as well as uniforms .This indicates a significant increase in the size of the repetitions so that their bodies are directed to produce aerobic energy depending on the oxygen and thus the goal of the exercise differs. The researcher noticed during the application of the training program the occurrence of adaptations in the players to the performance of the initial loads a well as the occurrence of some different functional effects and this confirms the results of the previous research hypotheses .It has improved in the telemetry of all variables (biochemical - functional - physical). The proposed training program, which included modern and varied training methods, contributed to this remarkable improvement in the results obtained through tests and special physical abilities, given that there is no integration between the physical elements.

## Conclusions and recommendations

### Conclusion

1. The special endurance training resulted in the improvement of endorphins, lactic acid, lactic dehydrogenate in the research sample.
2. The exercises prepared by the researcher worked to reduce the boxers 'fatigue during competition

### Recommendations

1. Boxing coaches need to approve (special endurance) exercises.
2. Conducting a study to identify the effect of dynamic lactate training on some physiological variables and the level of skill performance in other sports activities.

## References


1. Ahmed Mahmoud El-Khadem Practical applications of anaerobic and aerobic training and energy production systems: (Cairo, Bulletin of the Regional Development Center, Issue 26, 1999).
2. Bastwissi and Issam Abdel Khaleq: Foundations and Theories of Sports Training, Dar Al Fikr Al Arabi, 1st Edition, Cairo & 1999.
3. Hussein Manati Sajit: Physiology of Exercise, 1st Edition, Dar Al-Sadiq Publishing and Distribution, Babel, 2017.
4. Falah Hassan Abdullah: The effect of anaerobic training on the efficiency of some biological organizations and biochemical variables for developing the lactic endurance of basketball players, PhD thesis, University of Babylon, Collegeof Physical Education, 2008.
5. Antony D.Mehon , Blood , Lactate and Perceived Exertion Relative To VentilartoyShold boys Versus Men , In medical and Since and in Sport and exercise , Vo 129 . no 10 , October.


## Appendix 1: Proposed special endurance exercises

1. Freely perform straight punches to the head and torso.
2. Compound exercises using heavy paws and punching the bag. Using two arguments (to be applied with the colleague), as follows:
3. Boxer No. (1) directs a straight left punch to the face of Boxer No. (2).
4. Boxer No. 2 gets rid of pulling the torso back and directs a left counter-punch to Boxer No. 1's face.
5. Boxer No. (1) eliminates the punch in the palm of the right palm.
6. Compound exercises to combine attack and defense with counter punches (to be applied with the colleague).
7. Boxer No. (1) directs a straight left punch to the face of Boxer No. (2).
8. Boxer No. (2) gets rid of the punch in the palm of the right palm and directs a left counter-punch to the face of Boxer No. 1.
9. Boxer No. 1 ditches by pulling the torso back and directing a left counter-punch.
10. Boxer No. (2) gets rid of boxer No. (2) tilting the torso to the right side with bending the knees and directing a straight punch left to the torso of Boxer No. (1).
11. Boxer No. 1 gets rid by taking a step with the legs back and pushing the arm down
12. Compound exercises to combine offensive punches with defense with counter punches applied with the colleague.
13. Boxer No. (1) directs a straight left punch to the face of Boxer No. (2)
14. Boxer No. 2 gets rid by pulling the torso back and directing a counter-left punch to the face of Boxer No. 1
15. Boxer No. (1) gets rid of the punch and directs a counter-left punch to the face of the boxer (2)
16. Boxer No. (2) gets rid by leaning to the right and directing a left punch to the torso of Boxer No. (1)
17. Boxer No. 1 gets rid by taking a step with the legs back and pushing the arm down.
18. Play freestyle boxing using only the left straight punch and its defenses.
19. Defensive offensive vehicle exercises for right-handed straight punches (application with colleague)
20. A - Boxing No. (1) directs a straight punch to the right of Boxer No. (2) Boxer No. (2) gets rid of the punch in the right palm o

21.B - Boxing No. (1) directs a straight punch to the right of boxer No. (2) Boxer No. (2) gets rid of pulling the torso back.
22.10.Exercises of the offensive defensive vehicle to counter punches (applied with the colleague.
23.Boxing No. (1) directs a straight punch to the right of Boxer No. (2)

**Appendix 2 : A model for a training unit**

| Exercise no. | Intensity | Exercise time | Repetition | Break | |
|---|---|---|---|---|---|
| | | | | Repetition | group |
| **7** | 80-85 | 3 minutes | 6 | 90 sec. | - |
| **1** | 80-85 | 3 minutes | 6 | 90 sec. | - |
| **3** | 85-90 | 90 seconds | 3 | 180 sec. | - |